## Volume Contents

### NUMBER 1


| | | |
|---|---|---|
| **C.-B. Lin** and **C.-S. Yeh** | 1 | The magnetoelastic problem of a crack in a soft ferromagnetic solid |
| **S.-H. Lin, J. Pan, S.-R. Wu, T. Tyan** and **P. Wung** | 19 | Failure loads of spot welds under combined opening and shear static loading conditions |
| **O. A. Bauchau** and **J. Rodriguez** | 41 | Modeling of joints with clearance in flexible multibody systems |
| **Y. B. Zhao, G. W. Wei** and **Y. Xiang** | 65 | Discrete singular convolution for the prediction of high frequency vibration of plates |
| **L. Gorbatikh, B. Nuller** and **M. Kachanov** | 89 | Non-uniform frictional sliding under cyclic loading with frictional characteristics changing in the process of sliding |
| **Y.-L. Pi, M. A. Bradford** and **B. Uy** | 105 | In-plane stability of arches |
| **K. H. Lee, G. T. Lim** and **C. M. Wang** | 127 | Thick Lévy plates re-visited |
| **D. D. Quinn** and **J. A. Pelesko** | 145 | Generic unfolding of the thermoelastic contact instability |
| **N. Ohno, T. Ando, T. Miyake** and **S. Biwa** | 159 | A variational method for unidirectional fiber-reinforced composites with matrix creep |
| **M.-L. Dano** and **M. W. Hyer** | 175 | Snap-through of unsymmetric fiber-reinforced composite laminates |
| **M. Jiang, I. Jasiuk** and **M. Ostoja-Starzewski** | 199 | Apparent elastic and elastoplastic behavior of periodic composites |
| **J. M. Yuan** and **V. P. W. Shim** | 213 | Tensile response of ductile $\alpha$-titanium at moderately high strain rates |
| **M. Dalenbring** | 225 | An explicit formulation of a three-dimensional material damping model with transverse isotropy |
| **A. G. Bagdoev** and **A. A. Vantsyan** | 251 | Theoretical and experimental investigations of waves in plate in magnetic field for space and averaged problems |
| **G. R. Liu** | 261 | A point assembly method for stress analysis for two-dimensional solids |
| | 277 | Keywords |


### NUMBER 2


| | | |
|---|---|---|
| **E. W. Andrews, A. E. Giannakopoulos, E. Plisson** and **S. Suresh** | 281 | Analysis of the impact of a sharp indenter |

**M. Zhou** and **W. P. Schonberg** 297 Smooth static and dynamic indentation of a cantilever beam

**N. P. Kruyt** and **L. Rothenburg** 311 Micromechanical bounds for the effective elastic moduli of granular materials

**E. D. Reedy Jr.** and **T. R. Guess** 325 Nucleation and propagation of an edge crack in a uniformly cooled epoxy/glass bimaterial

**F. M. Detinko** 341 Some phenomena for lateral flutter of beams under follower load

**S. Kyriakides** 351 Buckle propagation in pipe-in-pipe systems. Part I. Experiments

**S. Kyriakides** and **T. J. Vogler** 367 Buckle propagation in pipe-in-pipe systems. Part II. Analysis

**H. Fukunaga, N. Hu** and **F.-K. Chang** 393 Structural damage identification using piezoelectric sensors

**X. Peng, J. Fan** and **Y. Yang** 419 A microstructure-based description for cyclic plasticity of pearlitic steel with experimental verification

**X. Peng, J. Fan** and **J. Zeng** 435 Microstructure-based description for the mechanical behavior of single pearlitic colony

**V. V. Moshev** and **L. L. Kozhevnikova** 449 Structural cell of particulate elastomeric composites under extension and compression

**R. Gilat** and **J. Aboudi** 467 The Lyapunov exponents as a quantitative criterion for the dynamic buckling of composite plates

**F. J. Sabina, J. Bravo-Castillero, R. Guinovart-Díaz, R. Rodríguez-Ramos** and **O. C. Valdiviezo-Mijangos** 483 Overall behavior of two-dimensional periodic composites

**A. Ibrahimbegovic** and **L. Chorfi** 499 Covariant principal axis formulation of associated coupled thermoplasticity at finite strains and its numerical implementation

**X. Zhao, K. M. Liew** and **T. Y. Ng** 529 Vibrations of rotating cross-ply laminated circular cylindrical shells with stringer and ring stiffeners

**H. A. Bruck** and **A. L. Gershon** 547 Three-dimensional effects near the interface in a functionally graded $Ni–Al_2O_3$ plate specimen

I Announcement

**NUMBER 3**


| | | |
|---|---|---|
| **R. Y. Vasudeva** and **G. Sudheer** | 559 | Lamb mode stresses as means of identifying voids in the adhesive zone of bilaminates |
| **N. P. Kruyt** and **L. Rothenburg** | 571 | Probability density functions of contact forces for cohesionless frictional granular materials |
| **X. D. Wang** and **L. Y. Jiang** | 585 | Nonlinear behaviour of interacting dielectric cracks in piezoelectric materials |
| **Z. Li, C. Wang** and **C. Chen** | 601 | The influence of matrix yield stress gradient on the growth and coalescence of spheroidal voids |
| **A. Messina** and **K. P. Soldatos** | 617 | A general vibration model of angle-ply laminated plates that accounts for the continuity of interlaminar stresses |
| **S. Pietruszczak, D. Lydzba** and **J. F. Shao** | 637 | Modelling of inherent anisotropy in sedimentary rocks |
| **P. Lu** and **K. H. Lee** | 649 | A modified model for the prediction of effective elastic moduli of composite materials |
| **R. Zaera, A. Arias** and **C. Navarro** | 659 | Analytical modelling of metallic circular plates subjected to impulsive loads |
| **Y. K. Cheung** and **D. Zhou** | 673 | Three-dimensional vibration analysis of cantilevered and completely free isosceles triangular plates |
| **S. A. Ragon, Z. Gürdal** and **L. T. Watson** | 689 | A comparison of three algorithms for tracing nonlinear equilibrium paths of structural systems |
| **G. Semb** and **P. A. Gradin** | 699 | Stresses and strains in a race track strap with a radial clearance |
| **R. Peek** | 709 | Wrinkling of tubes in bending from finite strain three-dimensional continuum theory |
| **D. Guo, Z. Zheng** and **F. Chu** | 725 | Vibration analysis of spinning cylindrical shells by finite element method |
| **J. Zhu, N. Liang, W. Huang, K. M. Liew** and **Z. Liu** | 741 | A thermodynamic constitutive model for stress induced phase transformation in shape memory alloys |
| **L.-y. Li** and **R. Kettle** | 765 | Nonlinear bending response and buckling of ring-stiffened cylindrical shells under pure bending |
| **P. A. Kakavas** | 783 | Influence of the cavitation on the stress–strain fields of compressible Blatz-Ko materials at finite deformation |
| **J. M. Sánchez** and **J. L. Vega Miguel** | 797 | Computational micromechanics model for the convection of a cracks population in a brittle material |

## NUMBER 4


| | | |
|---|---|---|
| **S. V. Ugrimov** | 819 | Generalized theory of multilayer plates |
| **J. Ho Kwon** and **S. A. Meguid** | 841 | Analysis of a central crack normal to a piezoelectric–orthotropic interface |
| **W. Anwen** and **T. Wenying** | 861 | Twin-characteristic-parameter solution for dynamic buckling of columns under elastic compression wave |
| **X. N. Meng, M. A. LeRoux, T. A. Laursen** and **L. A. Setton** | 879 | A nonlinear finite element formulation for axisymmetric torsion of biphasic materials |
| **J. T. Katsikadelis** and **E. J. Sapountzakis** | 897 | A realistic estimation of the effective breadth of ribbed plates |
| **D. Bigoni** and **H. Petryk** | 911 | A note on divergence and flutter instabilities in elastic–plastic materials |
| **M. Ohsaki** | 927 | Maximum loads of imperfect systems corresponding to stable bifurcation |
| **S. T. Choi** and **Y. Y. Earmme** | 943 | Elastic study on singularities interacting with interfaces using alternating technique. Part I. Anisotropic trimaterial |
| **J. Jäger** | 959 | New analytical and numerical results for two-dimensional contact profiles |
| **R. M. Christensen, D. C. Freeman** and **S. J. DeTeresa** | 973 | Failure criteria for isotropic materials, applications to low-density types |
| **K. Inal, P. D. Wu** and **K. W. Neale** | 983 | Instability and localized deformation in polycrystalline solids under plane-strain tension |
| **C. N. Duong** and **J. Yu** | 1003 | An analytical estimate of thermal effects in a composite bonded repair: plane stress analysis |
| **S.-J. Kim** and **Q. Jiang** | 1015 | A finite element model for rate-dependent behavior of ferroelectric ceramics |
| **O. H. Galal, M. A. El-Tawil** and **A. A. Mahmoud** | 1031 | Stochastic beam equations under random dynamic loads |
| **E. Herve** | 1041 | Thermal and thermoelastic behaviour of multiply coated inclusion-reinforced composites |
| **H. Chtourou, M. Guillot** and **A. Gakwaya** | 1059 | Modeling of the metal powder compaction process using the cap model. Part I. Experimental material characterization and validation |
| **H. Chtourou, A. Gakwaya** and **M. Guillot** | 1077 | Modeling of the metal powder compaction process using the cap model. Part II. Numerical implementation and practical applications |

**NUMBER 5**


| | | |
|---|---|---|
| **X.-F. Li** | 1097 | Electroelastic analysis of an anti-plane shear crack in a piezoelectric ceramic strip |
| **Q. Wang** and **V. K. Varadan** | 1119 | Wave propagation in piezoelectric coupled plates by use of interdigital transducer. Part 1. Dispersion characteristics |
| **Q. Wang** and **V. K. Varadan** | 1131 | Wave propagation in piezoelectric coupled plates by use of interdigital transducer. Part 2. Wave excitation by interdigital transducer |
| **W. Han, K. L. Kuttler, M. Shillor** and **M. Sofonea** | 1145 | Elastic beam in adhesive contact |
| **L. M. Brock** | 1165 | Interface crack extension at any constant speed in orthotropic or transversely isotropic bimaterials—I. General exact solutions |
| **L. M. Brock** and **M. T. Hanson** | 1183 | Interface crack extension at any constant speed in orthotropic or transversely isotropic bimaterials—II. Two important examples |
| **S. T. Choi** and **Y. Y. Earmme** | 1199 | Elastic study on singularities interacting with interfaces using alternating technique. Part II. Isotropic trimaterial |
| **S. Li, W. K. Liu, A. J. Rosakis, T. Belytschko** and **W. Hao** | 1213 | Mesh-free Galerkin simulations of dynamic shear band propagation and failure mode transition |
| **S. H. Chen** and **T. C. Wang** | 1241 | Finite element solutions for plane strain mode I crack with strain gradient effects |
| **A. Libai** and **D. Givoli** | 1259 | Analysis of pulled axisymmetric membranes with wrinkling |
| **J. A. Shaw** | 1275 | A thermomechanical model for a 1-D shape memory alloy wire with propagating instabilities |
| **J. J. Evans** and **P. D. Wilcox** | 1307 | A structural model for high pressure helical wire-wound thermoplastic hose |
| **A. Mugadu** and **D. A. Hills** | 1327 | A generalised stress intensity approach to characterising the process zone in complete fretting contacts |
| **Y. Q. Sun** and **M. Dhanasekar** | 1337 | A dynamic model for the vertical interaction of the rail track and wagon system |
| **Y. B. Zhao, G. W. Wei** and **Y. Xiang** | 1361 | Plate vibration under irregular internal supports |
| **H.-Y. Jeong** | 1385 | A new yield function and a hydrostatic stress-controlled void nucleation model for porous solids with pressure-sensitive matrices |

**E. L. Albuquerque, P. Sollero** and **M. H. Aliabadi** 1405 The boundary element method applied to time dependent problems in anisotropic materials

1423 Keywords

**NUMBER 6**

**A. Abdul-Baqi** and **E. Van der Giessen** 1427 Numerical analysis of indentation-induced cracking of brittle coatings on ductile substrates

**J. M. Ambrico, E. E. Jones** and **M. R. Begley** 1443 Cracking in thin multi-layers with finite-width and periodic architectures

**A. Benjeddou** and **J.-F. Deü** 1463 A two-dimensional closed-form solution for the free-vibrations analysis of piezoelectric sandwich plates

**J.-Y. Kim** and **S. I. Rokhlin** 1487 Surface acoustic wave measurements of small fatigue cracks initiated from a surface cavity

**B. J. Chen, Z. M. Xiao** and **K. M. Liew** 1505 On the interaction between a semi-infinite anti-crack and a screw dislocation in piezoelectric solid

**M. Kashtalyan** and **C. Soutis** 1515 Analysis of local delaminations in composite laminates with angle-ply matrix cracks

**I. Tsukrov** and **J. Novak** 1539 Effective elastic properties of solids with defects of irregular shapes

**J. G. Wang, G. R. Liu** and **P. Lin** 1557 Numerical analysis of Biot's consolidation process by radial point interpolation method

**X. Han, F. Ellyin** and **Z. Xia** 1575 Interaction among interface, multiple cracks and dislocations

**X. Wang** and **Y.-p. Shen** 1591 Exact solution for mixed boundary value problems at anisotropic piezoelectric bimaterial interface and unification of various interface defects

**C. Atkinson** and **D. A. Eftaxiopoulos** 1621 Numerical and analytical solutions for the problem of hydraulic fracturing from a cased and cemented wellbore

**S. Okazawa, K. Oide, K. Ikeda** and **K. Terada** 1651 Imperfection sensitivity and probabilistic variation of tensile strength of steel members

**H. Parland** and **A. Miettinen** 1673 On the stiffness characteristics of nonmonolithic elastic structures. Part I. Theory

**A. Miettinen** and **H. Parland** 1701 On the stiffness characteristics of nonmonolithic elastic structures. Part II. Applications and examples

**R. Fosdick** 1729 Response to: Discussion on 'A. Aguiar and R. Fosdick, Self-intersection in elasticity' [International Journal of Solids and Structures 38 (28) (2001) 4797–4825]

**NUMBER 7**


| | | |
|---|---|---|
| **Z.-G. Zhou** and **B. Wang** | 1731 | Investigation of anti-plane shear behavior of two collinear cracks in the piezoelectric materials by using the non-local theory |
| **B. Gu, S.-W. Yu** and **X.-Q. Feng** | 1743 | Transient response of an interface crack between dissimilar piezoelectric layers under mechanical impacts |
| **K. R. Jayadevan, R. Narasimhan, T. S. Ramamurthy** and **B. Dattaguru** | 1757 | Effect of *T*-stress and loading rate on crack initiation in rate sensitive plastic materials |
| **H. Liu, T. J. Wang, Z. K. Wang** and **Z. B. Kuang** | 1777 | Effect of a biasing electric field on the propagation of antisymmetric Lamb waves in piezoelectric plates |
| **R. Huang** and **Z. Suo** | 1791 | Instability of a compressed elastic film on a viscous layer |
| **J.-C. Hong, Y. Y. Kim, H. C. Lee** and **Y. W. Lee** | 1803 | Damage detection using the Lipschitz exponent estimated by the wavelet transform: applications to vibration modes of a beam |
| **Y.-Q. Zhang, H. Hao** and **M.-H. Yu** | 1817 | Effect of porosity on the properties of strain localization in porous media under undrained conditions |
| **M. Doyoyo** | 1833 | A theory of the densification-induced fragmentation in glasses and ceramics under dynamic compression |
| **A. Dorfmann, K. N. G. Fuller** and **R. W. Ogden** | 1845 | Shear, compressive and dilatational response of rubberlike solids subject to cavitation damage |
| **G. H. M. van der Heijden, A. R. Champneys** and **J. M. T. Thompson** | 1863 | Spatially complex localisation in twisted elastic rods constrained to a cylinder |
| **R. Lawther** | 1885 | Altering structures to move vibration frequencies using acceptable changes |
| **Q. M. Li** and **N. Jones** | 1919 | Response and failure of a double-shear beam subjected to mass impact |
| **A. G. Radu** and **A. Chattopadhyay** | 1949 | Dynamic stability analysis of composite plates including delaminations using a higher order theory and transformation matrix approach |
| **E. Car, F. Zalamea, S. Oller, J. Miquel** and **E. Oñate** | 1967 | Numerical simulation of fiber reinforced composite materials–two procedures |
| **B. A. Bednarcyk** and **S. M. Arnold** | 1987 | Transverse tensile and creep modeling of continuously reinforced titanium composites with local debonding |

**C. W. Shul** and **K. Y. Lee** 2019 A subsurface eccentric crack in a functionally graded coating layer on the layered half-space under an anti-plane shear impact load

**H. Liu, T. J. Wang, Z. K. Wang** and **Z. B. Kuang** 2031 Effect of a biasing electric field on the propagation of symmetric Lamb waves in piezoelectric plates

2051 EUROMECH Colloquia

2055 Keywords

**NUMBER 8**

**S. A. Karamanos** 2059 Bending instabilities of elastic tubes

**N. H. Kim, K. Yi** and **K. K. Choi** 2087 A material derivative approach in design sensitivity analysis of three-dimensional contact problems

**S.-E. Kim, J. Lee** and **J.-S. Park** 2109 3-D second-order plastic-hinge analysis accounting for lateral torsional buckling

**X. Liu, Q. Wang** and **S. T. Quek** 2129 Analytical solution for free vibration of piezoelectric coupled moderately thick circular plates

**X. F. Xu** and **P. Qiao** 2153 Homogenized elastic properties of honeycomb sandwich with skin effect

**R. Al-Khoury, A. Scarpas, C. Kasbergen** and **J. Blaauwendraad** 2189 Spectral element technique for efficient parameter identification of layered media. Part III: viscoelastic aspects

**J. Wang** 2203 Overall moduli and constitutive relations of bodies containing multiple bridged microcracks

**C. Sultan, M. Corless** and **R. E. Skelton** 2215 Symmetrical reconfiguration of tensegrity structures

**B. Yang** and **E. Pan** 2235 Three-dimensional Green's functions in anisotropic trimaterials

**D. A. Saravanos** and **A. P. Christoforou** 2257 Low-energy impact of adaptive cylindrical piezoelectric–composite shells

**P. Isaksson** and **P. Ståhle** 2281 Mode II crack paths under compression in brittle solids–a theory and experimental comparison

**Y.-L. Pi** and **M. A. Bradford** 2299 Elastic flexural-torsional buckling of continuously restrained arches

**P. W. Christensen** 2323 A semi-smooth Newton method for elasto-plastic contact problems

**G. Limbert** and **M. Taylor** 2343 On the constitutive modeling of biological soft connective tissues. A general theoretical framework and explicit forms of the tensors of elasticity for strongly anisotropic continuum fiber-reinforced composites at finite strain

**M. Rahman** 2359 Discussion on "A. Aguiar and R. Fosdick, Self-intersection in elasticity"

2361 Announcement

2363 IMPLAST'03

I M.I.T. Conference

**NUMBER 9**

**M. Bonnet, T. Burczyński** and **M. Nowakowski** 2365 Sensitivity analysis for shape perturbation of cavity or internal crack using BIE and adjoint variable approach

**Q. S. Li** 2387 Non-conservative stability of multi-step non-uniform columns

**Z. X. Li, T. H. T. Chan** and **J. M. Ko** 2401 Determination of effective stress range and its application on fatigue stress assessment of existing bridges

**A. Moura** 2419 Closed-form solution for Mode I crack acceleration

**F. Greco, P. Lonetti** and **R. Zinno** 2435 An analytical delamination model for laminated plates including bridging effects

**S. Chakraborty** and **B. Bhattacharyya** 2465 An efficient 3D stochastic finite element method

**X. Zhao** and **S. A. Meguid** 2477 On the dynamic behaviour of a piezoelectric laminate with multiple interfacial collinear cracks

**A. E. Giannakopoulos** 2495 Indentation of plastically graded substrates by sharp indentors

**S. Jia, G. F. Raiser** and **G. L. Povirk** 2517 Modeling the effects of hole distribution in perforated aluminum sheets I: representative unit cells

**S. Jia** and **G. L. Povirk** 2533 Modeling the effects of hole distribution in perforated aluminum sheets II: minimum strength failure paths

**J. Jin, Q. Wang** and **S. T. Quek** 2547 Lamb wave propagation in a metallic semi-infinite medium covered with piezoelectric layer

**J. E. Dolbow** and **M. Gosz** 2557 On the computation of mixed-mode stress intensity factors in functionally graded materials

**R. Lipton** 2575 Design of functionally graded composite structures in the presence of stress constraints

**J. Aboudi** 2587 Micromechanical analysis of the fully coupled finite thermoelastic response of rubber-like matrix composites

**D.-S. Lee** 2613 A long circular cylinder with a circumferential edge crack subjected to a uniform shearing stress

**Y. T. Hu, J. S. Yang** and **Q. Jiang** 2629 A model for electroelastic plates under biasing fields with applications in buckling analysis

**A. D. Mesquita** and **H. B. Coda** 2643 Boundary integral equation method for general viscoelastic analysis

**C.-F. Gao, Y.-T. Zhao** and **M.-Z. Wang** 2665 An exact and explicit treatment of an elliptic hole problem in thermopiezoelectric media

2687 Keywords

**NUMBER 10**

**M. Grédiac, E. Toussaint** and **F. Pierron** 2691 Special virtual fields for the direct determination of material parameters with the virtual fields method. 1—Principle and definition

**M. Grédiac, E. Toussaint** and **F. Pierron** 2707 Special virtual fields for the direct determination of material parameters with the virtual fields method. 2—Application to in-plane properties

**F. Yang, A. C. M. Chong, D. C. C. Lam** and **P. Tong** 2731 Couple stress based strain gradient theory for elasticity

**S. M. Aizikovich, V. M. Alexandrov, J. J. Kalker, L. I. Krenev** and **I. S. Trubchik** 2745 Analytical solution of the spherical indentation problem for a half-space with gradients with the depth elastic properties

**B. Loret, T. Hueckel** and **A. Gajo** 2773 Chemo-mechanical coupling in saturated porous media: elastic–plastic behaviour of homoionic expansive clays

**C.-B. Lin** and **H.-M. Lin** 2807 The magnetoelastic problem of cracks in bonded dissimilar materials

**N. Chandra, H. Li, C. Shet** and **H. Ghonem** 2827 Some issues in the application of cohesive zone models for metal–ceramic interfaces

**T.-W. Kim** and **J.-H. Kim** 2857 Nonlinear vibration of viscoelastic laminated composite plates

**K.-H. Park** and **P. K. Banerjee** 2871 Two- and three-dimensional transient thermoelastic analysis by BEM via particular integrals

## NUMBER 11


| | | |
|---|---|---|
| **J. H.Kim, H. S.Kim, D. W. Kim** and **Y. Y. Kim** | 2893 | New accurate efficient modeling techniques for the vibration analysis of T-joint thin-walled box structures |
| **H. Chai** | 2911 | On the post-buckling behavior of bilaterally constrained plates |
| **Q. Li, L. Yuan** and **F. Ansari** | 2927 | Model for measurement of thermal expansion coefficient of concrete by fiber optic sensor |
| **Á. Sapkás** and **L. P. Kollár** | 2939 | Lateral-torsional buckling of composite beams |
| **M. El-Raheb** | 2965 | Dynamic instability of a disk forced by a pulse of short duration |
| **T. M. Atanackovic** and **V. B. Glavardanov** | 2987 | Buckling of a twisted and compressed rod |
| **C.-P. Wu** and **S.-J. Chiu** | 3001 | Thermally induced dynamic instability of laminated composite conical shells |
| **Q. Wang** | 3023 | Axi-symmetric wave propagation in a cylinder coated with a piezoelectric layer |
| **M.-W. Guo, I. E. Harik** and **W.-X. Ren** | 3039 | Buckling behavior of stiffened laminated plates |
| **O. Rabinovitch** and **Y. Frostig** | 3057 | High-order behavior of fully bonded and delaminated circular sandwich plates with laminated face sheets and a "soft" core |
| **K. P. Herrmann** and **V. G. Oshmyan** | 3079 | Theoretical study of formation of pores in elastic solids: particulate composites, rubber toughened polymers, crazing |
| | 3105 | Keywords |
| | | *Announcements* |
| | I | Metal Structures 2003 |
| | III | The Second International Conference on Structural Engineering, Mechanics and Computation |
| | VI | Fourth International Symposium on Vibrations of Continous Systems |


## NUMBER 12


| | | |
|---|---|---|
| **A. N. Eraslan** and **H. Argeso** | 3109 | Limit angular velocities of variable thickness rotating disks |

**C.-H. Chue** and **C.-D. Chen** 3131 Decoupled formulation of piezoelectric elasticity under generalized plane deformation and its application to wedge problems

**F. Bogard, K. Debray** and **Y. Q. Guo** 3159 Determination of sensor positions for predictive maintenance of revolving machines

**S. Turteltaub** 3175 Optimal control and optimization of functionally graded materials for thermomechanical processes

**J. K. Chen, J. E. Beraun, L. E. Grimes** and **D. Y. Tzou** 3199 Modeling of femtosecond laser-induced non-equilibrium deformation in metal films

**S. Goutianos, T. Peijs** and **C. Galiotis** 3217 Mechanisms of stress transfer and interface integrity in carbon/epoxy composites under compression loading. Part I: Experimental investigation

**A. Zucchini** and **P. B. Lourenço** 3233 A micro-mechanical model for the homogenisation of masonry

**H. Sabar, M. Berveiller, V. Favier** and **S. Berbenni** 3257 A new class of micro–macromodels for elastic–viscoplastic heterogeneous materials

**M. D. Sharma** 3277 Group velocity along general direction in a general anisotropic medium

**R. Desmorat** 3289 Fast estimation of localized plasticity and damage by energetic methods

I M.I.T. Conference

**NUMBERS 13–14**

3311 Preface

**E. Corona, J. A. Shaw** and **M. A. Iadicola** 3313 Buckling of steel bars with Lüders bands

**P. V. Lade** 3337 Instability, shear banding, and failure in granular materials

**J. G. M. van Mier** and **C. Shi** 3359 Stability issues in uniaxial tensile tests on brittle disordered materials

**H. M. Jensen** and **I. Sheinman** 3373 Numerical analysis of buckling-driven delamination

**A. Vainchtein** 3387 Dynamics of non-isothermal martensitic phase transitions and hysteresis

**Y. Tomita** and **W. Lu** 3409 Characterization of micro- to macroscopic response of polymers containing voids under macroscopically uniform deformation

**D. M. Wood** 3429 Some observations of volumetric instabilities in soils

| | | |
|---|---|---|
| **E. Fried** and **V. Korchagin** | 3451 | Striping of nematic elastomers |
| **K. Inal, P. D. Wu** and **K. W. Neale** | 3469 | Finite element analysis of localization in FCC polycrystalline sheets under plane stress tension |
| **D. Okumura, N. Ohno** and **H. Noguchi** | 3487 | Post-buckling analysis of elastic honeycombs subject to in-plane biaxial compression |
| **Th. Seelig** and **E. van der Giessen** | 3505 | Localized plastic deformation in ternary polymer blends |
| **C. di Prisco** and **S. Imposimato** | 3523 | Static liquefaction of a saturated loose sand stratum |
| **D. Schryvers, P. Boullay, P. L. Potapov, R. V. Kohn** and **J. M. Ball** | 3543 | Microstructures and interfaces in Ni–Al martensite: comparing HRTEM observations with continuum theories |
| **R. Becker** | 3555 | Ring fragmentation predictions using the Gurson model with material stability conditions as failure criteria |
| **V. Tvergaard** and **J. W. Hutchinson** | 3581 | Two mechanisms of ductile fracture: void by void growth versus multiple void interaction |
| **M. Laroussi, K. Sab** and **A. Alaoui** | 3599 | Foam mechanics: nonlinear response of an elastic 3D-periodic microstructure |
| **F. Oka, Y. Higo** and **S. Kimoto** | 3625 | Effect of dilatancy on the strain localization of water-saturated elasto-viscoplastic soil |
| **E. Byskov, J. Christoffersen, C. D. Christensen** and **J. S. Poulsen** | 3649 | Kinkband formation in wood and fiber composites—morphology and analysis |
| **H.-B. Mühlhaus, F. Dufour, L. Moresi** and **B. Hobbs** | 3675 | A director theory for visco-elastic folding instabilities in multilayered rock |
| **A. Benallal** and **C. Comi** | 3693 | Material instabilities in inelastic saturated porous media under dynamic loadings |
| **L. Léotoing, S. Drapier** and **A. Vautrin** | 3717 | Nonlinear interaction of geometrical and material properties in sandwich beam instabilities |
| **J. W. Rudnicki** | 3741 | Conditions for compaction and shear bands in a transversely isotropic material |
| **J. Desrues** and **R. Chambon** | 3757 | Shear band analysis and shear moduli calibration |
| **Yu Wang** and **A. M. Cuitiño** | 3777 | Full-field measurements of heterogeneous deformation patterns on polymeric foams using digital image correlation |
| **Q.-P. Sun** and **Z.-Q. Li** | 3797 | Phase transformation in superelastic NiTi polycrystalline micro-tubes under tension and torsion—from localization to homogeneous deformation |

| | | |
|---|---|---|
| **C. Făciu** and **M. Mihăilescu-Suliciu** | 3811 | On modelling phase propagation in SMAs by a Maxwellian thermo-viscoelastic approach |
| **I. Vardoulakis** | 3831 | Steady shear and thermal run-away in clayey gouges |
| **R. S. Elliott, J. A. Shaw** and **N. Triantafyllidis** | 3845 | Stability of pressure-dependent, thermally-induced displacive transformations in bi-atomic crystals |
| **C. G'Sell, J. M. Hiver** and **A. Dahoun** | 3857 | Experimental characterization of deformation damage in solid polymers under tension, and its interrelation with necking |
| **Y. M. Leroy, M. L. E. Guiton** and **N. Triantafyllidis** | 3873 | Post-buckling of an elastic plate over an inviscid and buoyant fluid |
| **P. Zhang, Y. Huang, P. H. Geubelle, P. A. Klein** and **K. C. Hwang** | 3893 | The elastic modulus of single-wall carbon nanotubes: a continuum analysis incorporating interatomic potentials |
| **P. K. Purohit** and **K. Bhattacharya** | 3907 | On beams made of a phase-transforming material |
| | 3931 | Keywords |


**NUMBER 15**


| | | |
|---|---|---|
| **X. J. Zheng, Y. C. Zhou** and **M. Z. Nin** | 3935 | Thermopiezoelectric response of a piezoelectric thin film PZT-6B deposited on MgO(100) substrate due to a continuous laser |
| **J. Wang, S. Fang** and **L. Chen** | 3959 | The state vector methods for space axisymmetric problems in multilayered piezoelectric media |
| **E. Radi, D. Bigoni** and **D. Capuani** | 3971 | Effects of pre-stress on crack-tip fields in elastic, incompressible solids |
| **W. Liang, D. Fang, Y. Shen** and **A. K. Soh** | 3997 | Nonlinear magnetoelastic coupling effects in a soft ferromagnetic material with a crack |
| **Q. Li, L. Zhang** and **F. Ansari** | 4013 | Damage constitutive for high strength concrete in triaxial cyclic compression |
| **X. Wang, G. Lu** and **S. R. Guillow** | 4027 | Stress wave propagation in orthotropic laminated thick-walled spherical shells |
| **V. B. Shenoy** | 4039 | Size-dependent rigidities of nanosized torsional elements |
| **Q. S. Xia, M. C. Boyce** and **D. M. Parks** | 4053 | A constitutive model for the anisotropic elastic–plastic deformation of paper and paperboard |
| **R. Al-Khoury, C. Kasbergen, A. Scarpas** and **J. Blaauwendraad** | 4073 | Poroelastic spectral element for wave propagation and parameter identification in multi-layer systems |

**S. Chiras, D. R. Mumm, A. G. Evans, N. Wicks, J. W. Hutchinson, K. Dharmasena, H. N. G. Wadley** and **S. Fichter** 4093 The structural performance of near-optimized truss core panels

**M. Woźniak, A. Hummel** and **V. J. Pauk** 4117 Axisymmetric contact problems for an elastic layer resting on a rigid base with a Winkler type excavitation

**NUMBER 16**

**S. I. Rokhlin** and **L. Wang** 4133 Ultrasonic waves in layered anisotropic media: characterization of multidirectional composites

**C. Galeş** 4151 On the spatial behavior in the theory of swelling porous elastic soils

**Q. Wang** and **S. T. Quek** 4167 Enhancing flutter and buckling capacity of column by piezoelectric layers

**M. Mosconi** 4181 Mixed variational formulations for continua with microstructure

**K. Yu. Volokh** 4197 On foundations of the Hardy Cross method

**J. Yu Li** 4201 Magnetoelectric Green's functions and their application to the inclusion and inhomogeneity problems

**L. R. Xu** and **A. J. Rosakis** 4215 Impact failure characteristics in sandwich structures. Part I: Basic failure mode selection

**L. R. Xu** and **A. J. Rosakis** 4237 Impact failure characteristics in sandwich structures. Part II: Effects of impact speed and interfacial strength

**A.-S. Bonnet-Lebouvier, A. Molinari** and **P. Lipinski** 4249 Analysis of the dynamic propagation of adiabatic shear bands

**H.-S. Shen** 4271 Postbuckling of laminated cylindrical shells with piezoelectric actuators under combined external pressure and heating

**E. G. Karpov, N. G. Stephen** and **D. L. Dorofeev** 4291 On static analysis of finite repetitive structures by discrete Fourier transform

**A. Kotousov** and **C. H. Wang** 4311 Three-dimensional stress constraint in an elastic plate with a notch

**A. Gajo, B. Loret** and **T. Hueckel** 4327 Electro-chemo-mechanical couplings in saturated porous media: elastic–plastic behaviour of heteroionic expansive clays

4363 Keywords

## NUMBER 17


| | | |
|---|---|---|
| **M. S. Kafkalidis** and **M. D. Thouless** | 4367 | The effects of geometry and material properties on the fracture of single lap-shear joints |
| **P. W. Fowler** and **S. D. Guest** | 4385 | Symmetry and states of self-stress in triangulated toroidal frames |
| **S. M. Kwon, J. S. Lee** and **K. Y. Lee** | 4395 | Moving eccentric crack in a piezoelectric strip bonded to elastic half planes |
| **A. Sackfield, A. Mugadu** and **D. A. Hills** | 4407 | The influence of an edge radius on the local stress field at the edge of a complete fretting contact |
| **V. Lazarus** and **J.-B. Leblond** | 4421 | In-plane perturbation of the tunnel-crack under shear loading I: bifurcation and stability of the straight configuration of the front |
| **V. Lazarus** and **J.-B. Leblond** | 4437 | In-plane perturbation of the tunnel-crack under shear loading II: Determination of the fundamental kernel |
| **V. Y. Perel** and **A. N. Palazotto** | 4457 | Finite element formulation for dynamics of delaminated composite beams with piezoelectric actuators |
| **Z.-G. Zhou** and **B. Wang** | 4485 | The behavior of two parallel symmetry permeable interface cracks in a piezoelectric layer bonded to two half piezoelectric materials planes |
| **B. L. Wang** and **Y.-W. Mai** | 4501 | A piezoelectric material strip with a crack perpendicular to its boundary surfaces |
| **H.-S. Shen** and **Q. S. Li** | 4525 | Thermomechanical postbuckling of shear deformable laminated cylindrical shells with local geometric imperfections |
| **S. Filippi, P. Lazzarin** and **R. Tovo** | 4543 | Developments of some explicit formulas useful to describe elastic stress fields ahead of notches in plates |
| **A. Mukherjee** and **A. S. Chaudhuri** | 4567 | Piezolaminated beams with large deformations |
| **H. Bai, A. H. Shah, N. Popplewell** and **S. K. Datta** | 4583 | Scattering of guided waves by circumferential cracks in composite cylinders |


## NUMBER 18


| | | |
|---|---|---|
| **H.-S. Ma, J.-H. Prévost** and **G. W. Scherer** | 4605 | Elasticity of DLCA model gels with loops |
| **C. K. Lyons** | 4615 | Stress functions for a heterogeneous section of a tree |
| **V. A. Lubarda** and **A. Hoger** | 4627 | On the mechanics of solids with a growing mass |
| **C. K. Lyons, R. B. Guenther** and **M. R. Pyles** | 4665 | Considering heterogeneity in a cylindrical section of a tree |

**Q. Luo** and **L. Tong** 4677 Exact static solutions to piezoelectric smart beams including peel stresses. I: Theoretical formulation

**Q. Luo** and **L. Tong** 4697 Exact static solutions to piezoelectric smart beams including peel stresses. II. Numerical results, comparison and discussion

**S. G. Mogilevskaya** and **S. L. Crouch** 4723 A Galerkin boundary integral method for multiple circular elastic inclusions with homogeneously imperfect interfaces

**S. Butkewitsch** and **V. Steffen Jr.** 4747 Shape optimization, model updating and empirical modeling applied to the design synthesis of a heavy truck side guard

**C. K. Lyons, R. B. Guenther** and **M. R. Pyles** 4773 Elastic equations for a cylindrical section of a tree

**A. Seweryn** 4787 Modeling of singular stress fields using finite element method

**C.-D. Wang** and **J.-J. Liao** 4805 Elastic solutions of displacements for a transversely isotropic half-space subjected to three-dimensional buried parabolic rectangular loads

**Y.-C. Wang** and **R. Lakes** 4825 Analytical parametric analysis of the contact problem of human buttocks and negative Poisson's ratio foam cushions

4839 Keywords

**NUMBER 19**

**D. Bigoni** and **A. B. Movchan** 4843 Statics and dynamics of structural interfaces in elasticity

**S. E. Rutgerson** and **W. J. Bottega** 4867 Thermo-elastic buckling of layered shell segments

**N. I. Robinson** 4889 An isotropic elastic medium containing a cylindrical borehole with a rigid plug

**M. C. Hsieh** and **C. Hwu** 4905 Anisotropic elastic plates with holes/cracks/inclusions subjected to out-of-plane bending moments

**G. Karami** and **P. Malekzadeh** 4927 Static and stability analyses of arbitrary straight-sided quadrilateral thin plates by DQM

**W. Dornowski** and **P. Perzyna** 4949 Numerical analysis of macrocrack propagation along a bimaterial interface under dynamic loading processes

**J.-Q. Tarn** and **L.-J. Huang** 4979 Saint-Venant end effects in multilayered piezoelectric laminates

**H. Bart-Smith, J. W. Hutchinson, N. A. Fleck** and **A. G. Evans** 4999 Influence of imperfections on the performance of metal foam core sandwich panels

**V. M. Levin, T. M. Michelitsch and H. Gao** 5013 Propagation of electroacoustic waves in the transversely isotropic piezoelectric medium reinforced by randomly distributed cylindrical inhomogeneities

**M. Dalenbring** 5053 Experimental material damping estimation for planar isotropic laminate structures

**M. B. Rubin and S. R. Bodner** 5081 A three-dimensional nonlinear model for dissipative response of soft tissue

**W. Yu, D. H. Hodges, V. Volovoi and C. E. S. Cesnik** 5101 On Timoshenko-like modeling of initially curved and twisted composite beams

**NUMBER 20**

**C.-S. Han, Y. Choi, J.-K. Lee and R. H. Wagoner** 5123 A FE formulation for elasto-plastic materials with planar anisotropic yield functions and plastic spin

**J.-Q. Tarn** 5143 A state space formalism for anisotropic elasticity. Part I: Rectilinear anisotropy

**J.-Q. Tarn** 5157 A state space formalism for anisotropic elasticity. Part II: Cylindrical anisotropy

**J.-Q. Tarn** 5173 A state space formalism for piezothermoelasticity

**W. Yu, D. H. Hodges and V. V. Volovoi** 5185 Asymptotic construction of Reissner-like composite plate theory with accurate strain recovery

**P. Grassl, K. Lundgren and K. Gylltoft** 5205 Concrete in compression: a plasticity theory with a novel hardening law

**Z. Li and L. Yang** 5225 The application of the Eshelby equivalent inclusion method for unifying modulus and transformation toughening

**H. Y. Fang, J. S. Yang and Q. Jiang** 5241 Rotation sensitivity of waves propagating in a rotating piezoelectric plate

**C.-C. Ma and R.-L. Lin** 5253 Image singularities of Green's functions for isotropic elastic bimaterials subjected to concentrated forces and dislocations

**L. Feng, K.-s. Zhang, G. Zhang and H.-d. Yu** 5279 Anisotropic damage model under continuum slip crystal plasticity theory for single crystals

**S. Alessandroni, F. dell'Isola and M. Porfiri** 5295 A revival of electric analogs for vibrating mechanical systems aimed to their efficient control by PZT actuators

**X.-H. Wu, C. Chen, Y.-P. Shen and X.-G. Tian** 5325 A high order theory for functionally graded piezoelectric shells

**Q. Grimal, S. Naili** and **A. Watzky** 5345 A study of transient elastic wave propagation in a bimaterial modeling the thorax

5371 Keywords

**NUMBERS 21–22**

5375 Preface

**A. T. de Hoop** 5379 Reflection and transmission of a transient, elastic, line-source excited SH wave by a planar, elastic bonding surface in a solid

**L. M. Brock** and **M. T. Hanson** 5393 An exact transient analysis of plane wave diffraction by a crack in an orthotropic or transversely isotropic solid

**S. Woolfries, A. B. Movchan** and **J. R. Willis** 5409 Perturbation of a dynamic planar crack moving in a model viscoelastic solid

**T. C. T. Ting** 5427 A unified formalism for elastostatics or steady state motion of compressible or incompressible anisotropic elastic materials

**X.-Y. Su, J.-Y. Tian** and **Y.-H. Pao** 5447 Application of the reverberation-ray matrix to the propagation of elastic waves in a layered solid

**F. Ziegler** 5465 Acoustic emission from strain-determined sources

**A. Mal** 5481 Elastic waves from localized sources in composite laminates

**D. E. Chimenti** and **D. Fei** 5495 Scattering coefficient reconstruction in plates using focused acoustic beams

**A. J. Niklasson** and **S. K. Datta** 5515 On transient ultrasonic waves in a homogeneous plate with thin superconducting coating layers

**S. I. Rokhlin** and **L. Wang** 5529 Ultrasonic waves in layered anisotropic media: characterization of multidirectional composites

**B. V. Budaev** and **D. B. Bogy** 5547 Random walk methods and wave diffraction

**D. A. Kovriguine, G. A. Maugin** and **A. I. Potapov** 5571 Multiwave non-linear couplings in elastic structures Part 1. One-dimensional examples

**T. Meurer, J. Qu** and **L. J. Jacobs** 5585 Wave propagation in nonlinear and hysteretic media—a numerical study

**P. R. Guduru** and **L. B. Freund** 5615 The dynamics of multiple neck formation and fragmentation in high rate extension of ductile materials

**Z. P. Bažant** and **Z. Guo** 5633 Size effect and asymptotic matching approximations in strain-gradient theories of micro-scale plasticity

**A. P. Suvorov** and **G. J. Dvorak** 5659 Rate form of the Eshelby and hill tensors

*Announcement*

5679 PACAM VIII Eighth Pan-American congress of applied mechanics

5680 Keywords

**NUMBER 23**

**L. M. Brock** and **M. T. Hanson** 5683 SH-wave diffraction by an interfacial flaw in monoclinic bimaterials

**A. D. Drozdov** and **A. Dorfmann** 5699 The nonlinear viscoelastic response of carbon black-filled natural rubbers

**L. A. de Lacerda** and **L. C. Wrobel** 5719 An efficient numerical model for contact-induced crack propagation analysis

**Y. Ootao** and **Y. Tanigawa** 5737 Transient piezothermoelasticity for a cylindrical composite panel composed of angle-ply and piezoelectric laminae

**Z. Zhong** and **Q. P. Sun** 5753 Analysis of a transversely isotropic rod containing a single cylindrical inclusion with axisymmetric eigenstrains

**J. Li** 5767 Singularity analysis of near-tip fields for notches formed from several anisotropic plates under bending

**Y. Z. Chen** and **K. Y. Lee** 5787 Solution of flat crack problem by using variational principle and differential–integral equation

**H. J. Kim, C. C. Swan** and **R. S. Lakes** 5799 Computational studies on high-stiffness, high-damping SiC–InSn particulate reinforced composites

**A. J. Levy** 5813 Separation phenomena at the interface of a finitely deformed composite sphere

**R. J. Zhang, G. H. Nie, S. H. Hou** and **C. K. Chan** 5837 Determination of added fluid area in the homogenization model of beam bundles

**W. Hu, X. Zhang** and **Q. Meng** 5851 Energy approach to a linearization contact problem of simply supported cross-ply laminated composite plate

**K. Y. Maalawi** 5865 Buckling optimization of flexible columns

5877 Announcement

**NUMBER 24**

**J. M. Horton, G. E. Tupholme** and **M. J. C. Gover** 5879 Bending of circular-section bonded rubber blocks

**X. Wang** and **Z. Zhong** 5895 A conducting arc crack between a circular piezoelectric inclusion and an unbounded matrix

**A. I. Leonov** 5913 A theory of necking in semi-crystalline polymers

**R. Artan** and **B. S. Altan** 5927 Propagation of SV waves in a periodically layered media in nonlocal elasticity

**M. Ganapathi, B. P. Patel** and **D. S. Pawargi** 5945 Dynamic analysis of laminated cross-ply composite non-circular thick cylindrical shells using higher-order theory

**M. Itskov** and **N. Aksel** 5963 A closed-form representation for the derivative of non-symmetric tensor power series

**X. He** and **M. Stallybrass** 5979 Drop induced impact response of a printed wiring board

**H.-S. Shen** 5991 Postbuckling analysis of axially loaded functionally graded cylindrical panels in thermal environments

**M. R. Karim, J. G. Wang** and **T. Nogami** 6011 Analysis of transient response of saturated porous elastic soil under cyclic loading using element-free Galerkin method

**A. P. S. Selvadurai** 6035 Mechanics of a rigid circular disc bonded to a cracked elastic half-space

**C.-H. Chang** 6055 Modeling of laminated rubber bearings using an analytical stiffness matrix

I Keywords

**NUMBER 25**

**D. Eastbury** 6079 Online access for everyone via ScienceDirect

**Y. Xiang** 6081 Exact vibration solutions for circular Mindlin plates with multiple concentric ring supports

**Q. Grimal, S. Naili** and **A. Watzky** 6103 Transient elastic wave propagation in a spherically symmetric bimaterial medium modeling the thorax

**X. X. Hu, T. Sakiyama, H. Matsuda** and **C. Morita** 6121 Vibration analysis of rotating twisted and open conical shells

**C. Yu, A. Pandolfi, M. Ortiz, D. Coker** and **A. J. Rosakis** 6135 Three-dimensional modeling of intersonic shear-crack growth in asymmetrically loaded unidirectional composite plates

**C. Moyne** and **M. A. Murad** 6159 Electro-chemo-mechanical couplings in swelling clays derived from a micro/macro-homogenization procedure

**A. De Falco** and **M. Lucchesi** 6191 Stability of columns with no tension strength and bounded compressive strength and deformability. Part I: large eccentricity

**F. Fraternali, M. Angelillo** and **A. Fortunato** 6211 A lumped stress method for plane elastic problems and the discrete-continuum approximation

**L. Contrafatto** and **M. Cuomo** 6241 A new thermodynamically consistent continuum model for hardening plasticity coupled with damage

*Announcements*

6273 Metal Structures 2003

6275 Fourth International Symposium on Vibrations of Continous Systems

*Preliminary Announcement*

6277 The Second International Conference on Structural Engineering, Mechanics and Computation

**NUMBER 26**

**P. Cermelli** and **M. E. Gurtin** 6281 Geometrically necessary dislocations in viscoplastic single crystals and bicrystals undergoing small deformations

**A. A. Savitski** and **E. Detournay** 6311 Propagation of a penny-shaped fluid-driven fracture in an impermeable rock: asymptotic solutions

**D. Zhou, Y. K. Cheung, F. T. K. Au** and **S. H. Lo** 6339 Three-dimensional vibration analysis of thick rectangular plates using Chebyshev polynomial and Ritz method

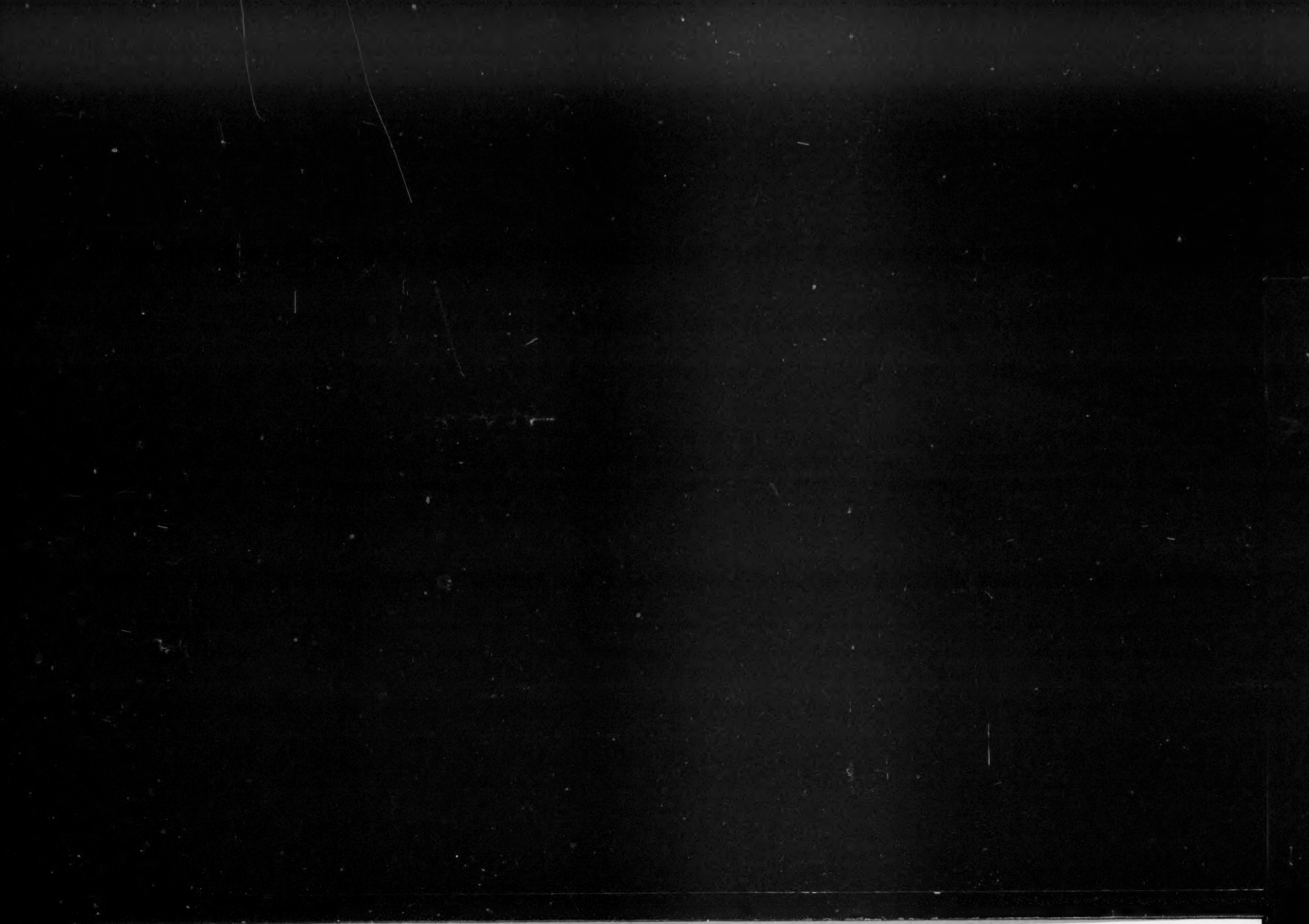
**F. Krasucki, A. Münch** and **Y. Ousset** 6355 Numerical simulation of debonding of adhesively bonded joint

**L. A. Fil'shtinskii, Yu. D. Kovalev** and **E. S. Ventsel** 6385 Solution of the elastic boundary value problems for a layer with tunnel stress raisers

**K. B. Broberg** 6403 Constant velocity crack propagation—dependence on remote load

**S.-E. Kim** and **K.-W. Kang** 6411 Large-scale testing of space steel frame subjected to non-proportional loads

**Q. Yu** and **J. Fish** 6429 Multiscale asymptotic homogenization for multiphysics problems with multiple spatial and temporal scales: a coupled thermo-viscoelastic example problem

III Volume Contents

XXV Author Index